UNDTCD/Energy Newsletter

United Nations Department of Technical Cooperation for Development -- January 1991

Peru -- Energy Conservation

Some developing countries have taken significant strides in the area of energy conservation, and Peru is one of those. Since 1984 under projects funded by UNDP and executed by UNDTCD, the Government of Peru has been assisted in the creation and strengthening of an independent institutional entity called the Center for Energy Conservation (CENERGIA). The mandate of CENERGIA is to formulate policies and programs for energy conservation, conduct energy audits and implement energy saving measures. Its field of responsibility covers the industrial, transport and residential/commercial sectors of the economy.

To date it has launched a national energy conservation campaign and conducted detailed energy audits in many major industries and transport systems. It is directly assisting enterprises in the implementation of energy saving measures. Potential annual energy savings identified by CENERGIA amount to 8 million barrels of oil. Efficiency improvements in the productive sector permitted savings of over 200,000 barrels of oil in the period 1989-90. Anticipated savings of oil imports for 1991-92 are roughly 600,000 barrels. Yet what is most promising is that CENERGIA presently earns 50% of its operating budget from fees charged to its clients, and this figure is expected to climb. The example of CENERGIA is a successful institutional case study which is a model for the region.

Chad -- Petroleum Exploration Promotion

Due to the existence of significant petroleum reserves, a consortium of international oil companies has been active in exploration in Chad since the 1970s. During this period the consortium has gathered and interpreted 32,051 kilometers of aeromagnetic coverage, 4,719 kilometers of gravity profiles and 21,586 kilometers of multiple coverage seismic lines. Twenty-five exploration plus four appraisal wells have been drilled. As a result of this activity there have been ten oil discoveries, three of which have commercial potential and one of which has been successfully appraised. However modest, these discoveries have led the government to decide to build a small refinery at N'Djamena sized to meet domestic product demand and to be supplied from the Sedigi discovery near Lake Chad. Existing permits were scheduled to expire in August 1988.

Before proceeding with the work necessary to develop Sedigi, or with additional exploration and appraisal work aimed at developing export supply, the consortium requested governmental assurance of continuity of existing permit rights and financial provisions past the permit expiration date, in exchange for firm additional work commitments.

On its side the government sought maximum financial participation by the consortium in the development of Sedigi, the Sedigi-N'Djamena pipeline, and construction of the refinery and adjacent

1990 Project Highlights

- ☐ *Peru -- Energy Conservation*
- ☐ *Chad -- Petroleum Exploration Promotion*
- ☐ *Mongolia -- Solar and Wind Energy*
- ☐ *Vietnam -- Power Plant Upgrading and Maintenance*
- ☐ *Ethiopia -- Sor River Hydropower Project*
- ☐ *Argentina -- Management Services Agreement*
- ☐ *Eastern Europe -- Computerized Coal Mining Systems*
- ☐ *Thailand -- Post-graduate Studies in Petroleum Engineering*
- ☐ *DTCD Advisory Services on Energy*

90-36497

electricity generating plant. It also sought modernization of the fiscal terms of the Convention in order to increase the government share of profits from the eventual export development scheme.

DTCD's assistance under a $660,000 project has been strengthening the government's capability to follow up and manage all activities related to petroleum exploration, production, transportation, refining and distribution. Assistance thus far has primarily provided high level impartial advice to the Energy Minister during negotiations with the oil companies and with financial lending institutions. The project has also been training government officials with an economic simulation software package of the type used in the oil industry.

The government is extremely satisfied with the project results. To date, DTCD investment advisory services have contributed to investment commitments of approximately $70 million from IDA and the World Bank.

Mongolia -- Solar and Wind Energy

DTCD has been cooperating with authorities in the People's Republic of Mongolia since 1980 to bring electric light and power to the nomadic herders who make up 15 percent of the population and are the mainstay of the economy.

Two approaches have proved viable. One is to use small (50 W) wind generators for charging batteries and providing electricity for light, radio, and television in the gers (also known as yurts, the felt tents which are home to the herders). The other approach is through solar photovoltaic panels (PV) for battery charging. In the more windy regions of the Gobi desert in the south the windchargers offer a slightly lower cost alternative but in much of the country only PV is suitable and in the longer run it will probably be cheaper as well.

Following successful testing and demonstration of these technologies DTCD has assisted the authorities in reaching a licensing agreement with Marlec Engineering in the UK for manufacture of the windchargers and in actively cooperating in this enterprize. It is the first such agreement signed by Mongolia with any western company. At the same time a separate UNDP/DTCD project has taken the first steps to initiate manufacture of PV panels in the country.

The project is also proceeding with the installation of a large biogas digester for 400 cows on a cattle farm and a test facility for solar hot water heaters.

For nomadic people and for farmers remote from central electric power supplies these solar PV domestic lighting kits are proving, in many parts of the world, the best solution to their basic electric energy probiems, although not yet cheap enough to reach the poorer subsistence farmers.

Vietnam -- Power Plant Upgrading and Maintenance

Prior to the project, the electric power supply system in the northern and central parts of the country were in a crisis condition. Existing power supply equipment was largely underutilized owing to lack of maintenance resulting from lack of spare parts and poor maintenance management, planning and execution. The total installed capacity of diesel powered plants in the central provinces amounted to 172 MW, of which only 75 MW was available. The northern region had an installed capacity of 950 MW, which includes hydro, coal-fired thermal and gas turbine units, but the availability was only 570 MW.

As well, several gas turbine and diesel power plants in each region were either out of operation or running under dangerous conditions for workers and the environment. Failure to redress these situations would have led to serious economic consequences.

Under the project a large training component is increasing capabilities in maintenance management for supervisory personnel, maintenance skills for technicians and craftsmen, and manufacturing and repair techniques for workshop operators. An efficient computerized maintenance management system is being installed to monitor and upgrade all power systems. Practical hands-on training includes overhaul of a 10 MW gas turbine plant at Thai Binh, overhaul of a 23.5 MW gas turbine plant at Haiphong, and overhaul of representative diesel power plants in the central region to increase generator capacity from 16 to 45 MW.

Ethiopia -- Sor River Hydropower Project

Small-scale hydropower development is one of the major fields in UNDTCD technical assistance to developing countries. The largest DTCD project in small-scale hydropower is the Sor river hydroelectric plant project. This project with international funding of about $14.5 million ($1.5 million contribution from UN Capital Development Fund and $13 million from an Italian Government Trust Fund) became operational in 1985. It is expected to be completed in the first half of 1991.

The main objective of this project is to replace existing diesel

power generating facilities in the regional centers of Mettu, Gambella and Dembidollo of the Illubabor region with a hydroelectric plant. The distribution network is being extended and expanded to connect approximately 62,500 inhabitants in 1991; this is planned to increase to over 212,000 by the year 2000.

The project is constructing a 5 MW (2 units of 2.5 MW each) plant and associated transmission line with a length of 240 km, three sub-stations and a distribution network covering 40 km of lines to neighboring villages.

The Ethiopian Electric Light and Power Authority (EELPA), under ENEL (Italian subcontractor) and UNDTCD supervision, organized and established work force brigades for the construction of civil works, erection of electro-mechanical equipment and construction of sub-stations, transmission and distribution lines. Construction work started in April 1987 and by the end of 1990 the first unit will operational. During that period of time hundreds of people have been trained in the construction of a hydropower station. This experience will assist further hydropower development work in other areas of Ethiopia.

The inauguration of the Sor Hydroelectric Plant is set for April 1991. The Illubabor region which is rich in natural resources and has vast potential for agricultural development will then be further empowered with access to affordable electricity.

Argentina -- Management Services Agreement

Under a management services agreement with Argentina, DTCD is assisting in the procurement of $1.8 million of modern computer and communications equipment to strengthen the Subsecretariat of Energy. The funds are part of a large World Bank loan targeting the modernization of the energy sector of the country.

The most striking result of the project thus far resulted from an analysis which demonstrated that in the international market DTCD could purchase twice as much equipment, dollar for dollar, as could be bought in the domestic market of Argentina. This has resulted in the reaping of an equipment bonanza which government planners had not foreseen.

Eastern Europe -- Computerized Coal Mining Systems

DTCD work in coal development continues through a regional project in Eastern Europe addressing computerization of coal mining operations with an emphasis on safety and environmental aspects. Participating countries include Bulgaria, Czechoslovakia, Hungary, Poland, Romania, Turkey, Yugoslavia and the U.S.S.R.

The project has successfully developed a computerized monitoring system for underground and surface coal mining which is specifically adapted to conditions in the countries. The project has established an inter-country network to coordinate research, development and marketing of the computer system. A follow-up project is being formulated to expand the scope of the computerization to include economic management and data acquisition. A training centre has been created in Czechoslovakia and is fully equipped with micro-computers and telecommunications equipment for demonstration of the monitoring system.

Among the safety and environmental aspects monitored are: performance and reliability of all heavy production equipment, underground transport systems, fan performance, pit slope stability, rock mass stress and strain, energy supply systems, air quality, water intrusion and mine personnel.

Thailand -- Post-graduate Studies in Petroleum Engineering

Due to the lack of appropriate curriculum in petroleum studies at Thai universities, the petroleum sector is heavily dominated by expatriate personnel, constituting more than 50 per cent of the total labour force. The Thai staff working in petroleum engineering is almost entirely trained abroad.

With an estimated demand for petroleum engineers of 10-15 per year, commensurate with the increasing development of indigenous resources, the government considers it a priority that in-country training facilities in this field should be developed to decrease reliance on expatriate personnel. Training in petroleum engineering is offered only by the Chulalongkorn University, where the Petroleum Section of the Mining Engineering Department provides an undergraduate programme in petroleum engineering. However, due to staffing constraints and lack of facilities, the programme cannot satisfactorily meet the requirements of industry and therefore further training abroad is necessary before they can be employed.

Wishing to respond to the growing need for petroleum engineers and face with a lack of national expertise to overcome the current deficiencies, the university urgently needs external assistance in order to be able to provide a programme which is of an internationally acceptable level as soon as possible. A DTCD project is providing assistance to develop

READEX FICHE

new courses in petroleum economics, gas and reservoir engineering and the improvement of library and laboratory facilities to upgrade the University's programme as soon as possible. The project is also helping the University to set up a graduate programme in petroleum engineering which aims to make Thailand fully self-reliant in providing skilled manpower at all levels and to promote indigenous research and development in this area.

DTCD Advisory Services on Energy

The United Nations Department of Technical Co-operation for Development (UN/DTCD) is providing technical advisory services to developing countries. Advisory services may be received by countries free of charge for a period not exceeding 3 weeks, subject to a country's request submitted through the respective UNDP office. The request should include the terms of reference for the advisory mission and proposed timing and duration of the mission. The type of assistance may be characterized as follows:

- technical ad-hoc advisory services
- project formulation
- project development
- training.

Missions are undertaken by DTCD Interregional Advisers. Their names and fields of specialization are given below:

Mr. Ola Gunnes -- Hydropower
Mr. Jan Jasiewicz -- Thermal Power Generation, Energy Conservation and Energy Planning
Mr. Derek Lovejoy -- Solar, Wind and Biomass Energy
Mr. Robert Ostrander -- Oil and Gas
Mr. Boris Vorobjev -- Coal
Mr. Frank Pinto -- Energy Planning
Mr. Michael Willingham -- Environment
Mr. Gustavo Cuellar -- Geothermal Energy

Kindly address all requests to:
Ms. Dunja Pastizzi-Ferencic, Director, Natural Resources and Energy Division, Department of Technical Cooperation for Development, United Nations, New York, U.S.A. 10017.